Listing of the Claims

1. (**previously amended**) A dispersion and dispersion slope compensating optical fiber, comprising:

a segmented core and a cladding layer on the periphery of the core wherein the segmented core and the cladding layer exhibit a fiber refractive index profile that is selected to provide a dispersion of less than about -50 ps/nm-km at a wavelength of about 1580 nm having a maximum deviation of less than about 7 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm the fiber refractive index profile has

a central core segment having a relative refractive index;

a depressed moat segment on a periphery of the central core segment and having a relative refractive index that is less than the relative refractive index of the central core segment, and an outer radius;

an intermediate segment on an outer periphery of the depressed moat segment and having a relative refractive index that is less than the relative refractive index of the central core segment and greater than the relative refractive index of the depressed moat segment, and an outer radius; and

an annular ring segment on a periphery of the intermediate segment and having a relative refractive index that is greater than the relative refractive index of the intermediate segment, and a width.

2. (**original**) The optical fiber of claim 1 wherein the refractive index profile is selected to provide a dispersion having a maximum deviation of less than about 5 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm.

3. (**previously amended**) A dispersion and dispersion slope compensating optical fiber, comprising:

a segmented core and a cladding layer on the periphery of the core wherein the segmented core and the cladding layer exhibit a fiber refractive index profile that is selected to provide a dispersion having a maximum deviation of less than about 7 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm wherein the refractive index profile is further selected to provide a fundamental mode bend loss of less than or equal to about 0.01 dB/km on a 4 inch diameter hub within a wavelength band from about 1550 nm to about 1610 nm.

4. (**original**) The optical fiber of claim 3 wherein the refractive index profile is further selected to provide an effective area of greater than or equal to about 17 μm^2 at a wavelength of about 1580 nm.

5. (**original**) The optical fiber of claim 4 wherein the refractive index profile is further selected to provide a straight fiber cut-off wavelength of less than or equal to about 2200 nm.

6. (**original**) The optical fiber of claim 1 wherein the refractive index profile is further selected to provide dispersion values at 1550 nm and 1610 nm which when connected with a straight line to form a chord, an extrapolation of the chord exhibits a projected zero dispersion located at a wavelength of between about 1400 nm and 1520 nm.

7. (**original**) The optical fiber of claim 6 wherein the refractive index profile is further selected to provide a projected zero dispersion located at a wavelength of between about 1490 nm and 1510 nm.

8. (**canceled**)

9. (**previously amended**) The optical fiber of claim 1, wherein the refractive index profile is further selected to provide a dispersion of less than about -75 ps/nm-km at a wavelength of about 1580 nm.

10. (**original**) The optical fiber of claim 9, wherein the refractive index profile is further selected to provide a dispersion of less than about -120 ps/nm-km at a wavelength of about 1580 nm.

11. (**original**) The optical fiber of claim 9 wherein the refractive index profile is further selected to provide a total dispersion slope of less than about -2 ps/nm^2-km at a wavelength of about 1580 nm.

12. (**canceled**)

13. (**previously amended**) A dispersion and dispersion slope compensating optical fiber, comprising:

a segmented core and a cladding layer on the periphery of the core wherein the segmented core and the cladding layer exhibit a fiber refractive index profile that is selected to provide a dispersion having a maximum deviation of less than about 7 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm wherein the segmented core comprises:

a central core segment having a relative refractive index;

a depressed moat segment on a periphery of the central core segment and having a relative refractive index that is less than the relative refractive index of the central core segment, and an outer radius;

an intermediate segment on an outer periphery of the depressed moat segment and having a relative refractive index that is less than the relative refractive index of the central core segment and greater than the relative refractive index of the depressed moat segment, and an outer radius; and

an annular ring segment on a periphery of the intermediate segment and having a relative refractive index that is greater than the relative refractive index of the intermediate segment, and a width and wherein

the relative refractive index percent of the core segment is within a range of from about 1.1% to about 1.7%;

the relative refractive index percent of the moat segment within a range of from about –1.6% to about -0.9%;

the relative refractive index percent of the intermediate segment is within a range of from about -0.1% to about 0.1%;

the relative refractive index percent of the ring segment is within a range of from about 1.0% to about 1.9%;

the outer radius of the central core region is within a range of from about 1.7 μm to about 2.7 μm;

the outer radius of the moat segment is within a range of from about 3.4 μm to about 5.2 μm;

the outer radius of the intermediate segment is within a range of from about 4.9 μm to about 7.5 μm; and

the width of the ring segment is within a range of from about 0.7 μm to about 1.2 μm.

14. **(previously amended)** The optical fiber of claim 13 wherein

the relative refractive index percent of the central core segment is within a range of from about 1.26% to about 1.54%;

the relative refractive index percent of the moat segment is within a range of from about -1.43% to about -1.00%;

the relative refractive index percent of the intermediate segment is within a range of from about -0.10% to about 0.10%;

the relative refractive index percent of the ring segment is within a range of from about 1.40% to about 1.71%;

the outer radius of the core region is within a range of from about 1.98 μm to about 2.42 μm;

the outer radius of the moat segment is within a range of from about 3.87 μm to about 4.73 μm;

the outer radius of the intermediate segment of within a range of from about 5.58 μm to about 6.82 μm; and

the width of the ring segment is within a range of from about 0.86 μm to about 1.05 μm.

15. **(previously amended)** The optical fiber of claim 13 wherein

the relative refractive index percent of the core segment is within a range of from about 1.33% to about 1.47%;

the relative refractive index percent of the moat segment is within a range of from about -1.37% to about -1.23%;

the relative refractive index percent of the intermediate segment is within a range of from about 0.00% to about 0.10%;

the relative refractive index percent of the ring segment is within a range of from about 1.47% to about 1.63%;

the outer radius of the core region is within a range of from about 2.09 μm to about 2.31 μm;

the outer radius of the moat segment is within a range of from about 4.09 μm to about 4.52 μm;

the outer radius of the intermediate segment is within a range of from about 5.89 μm to about 6.51 μm; and

the width of the ring segment is within a range of from about 0.90 μm to about 1.00 μm.

16. (**original**) The optical fiber of claim 15 wherein the refractive index profile is further selected to provide an effective area of greater than or equal to about 17 μm^2 at a wavelength of about 1580 nm.

17. (**original**) The optical fiber of claim 16 wherein the refractive index profile is further selected to provide a straight fiber cut-off wavelength of less than or equal to about 2200 nm.

18. (**original**) The optical fiber of claim 17 wherein the refractive index profile is further selected to provide a dispersion of less than or equal to about -120 ps/nm-km at a wavelength of about 1580 nm.

19. (**previously amended**) A dispersion and dispersion slope compensating optical fiber, comprising:

a segmented core and a cladding layer on the periphery of the core wherein the segmented core and the cladding layer exhibit a fiber refractive index profile that is selected to provide a dispersion having a maximum deviation of less than about 7 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm wherein the segmented core comprises:

a central core segment having a relative refractive index;

a depressed moat segment on a periphery of the central core segment and having a relative refractive index that is less than the relative refractive index of the central core segment, and an outer radius;

a first intermediate segment on a periphery of the depressed moat segment and having a relative refractive index that is less than the relative refractive index of the central core segment and greater than the relative refractive index of the depressed moat segment, and an outer radius;

an annular ring segment on a periphery of the first intermediate segment and having a relative refractive index that is greater than the relative refractive index of the first intermediate segment and less than the relative refractive index of the central core segment, and a width;

a second intermediate segment on a periphery of the ring segment and having a relative refractive index that is less than the relative refractive index of the central core segment and greater than the relative refractive index of the moat segment, and an outer radius;

a gutter segment on a periphery of the second intermediate segment and having a relative refractive index that is less than the relative refractive index of the second intermediate segment and greater than the relative refractive index of the depressed moat segment, and an outer radius.

20. (**previously amended**) The optical fiber of claim 19 wherein

the relative refractive index percent of the core segment is within a range of from about 1.2% to about 1.8%;

the relative refractive index percent of the moat segment is within a range of from about -1.2% to about -0.7%;

the relative refractive index percent of the first intermediate segment is within a range of from about -0.1% to about 0.1%;

the relative refractive index percent of the ring segment is within a range of from about 1.1% to about 1.8%;

the relative refractive index percent of the second intermediate segment is within a range of from about -0.1% to about 0.1%;

the relative refractive index percent of the gutter segment is within a range of from about –0.13% to about –0.21%;

the outer radius of the core region is within a range of from about 1.7 μm to about 2.5 μm;

the outer radius of the moat segment is within a range of from about 3.7 μm to about 5.5 μm;

the outer radius of the first intermediate segment is within a range of from about 5.1 μm to about 7.9 μm;

the width of the ring segment is within a range of from about 0.8 μm to about 1.3 μm;

the outer radius of the second intermediate segment is within a range of from about 7.7 μm to about 11.5 μm; and

the outer radius of the gutter segment is within a range of from about 11.0 μm to about 13.0 μm.

21. (**previously amended**) The optical fiber of claim 19 wherein

the relative refractive index percent of the core segment is within a range of from about 1.37% to about 1.67%;

the relative refractive index percent of the moat segment is within a range of from about -1.05% to about -0.86%;

the relative refractive index percent of the first intermediate segment is within a range of from about -0.10% to about 0.10%;

the relative refractive index percent of the ring segment is within a range of from about 1.32% to about 1.62%;

the relative refractive index percent of the second intermediate segment is within a range of from about -0.10% to about 0.10%;

the relative refractive index of the gutter segment is within a range of from about –0.15% to about –0.19%;

the outer radius of the core region is within a range of from about 1.89 μm to about 2.21 μm;

the outer radius of the moat segment is within a range of from about 4.14 μm to about 5.06 μm;

the outer radius of the first intermediate segment is within a range of from about 5.76 μm to about 7.04 μm;

the width of the ring segment is within a range of from about 0.90 μm to about 1.27 μm;

the outer radius of the second intermediate segment is within a range of from about 8.64 μm to about 10.56 μm; and

the outer radius of the gutter segment is within a range of from about 11.30 μm to about 12.30 μm.

22. (**previously amended**) The optical fiber of claim 19 wherein

the relative refractive index percent of the core segment is within a range of from about 1.44% to about 1.60%;

the relative refractive index percent of the moat segment is within a range of from about -1.00% to about -0.90%;

the relative refractive index percent of the first intermediate segment is within a range of from about -0.10% to about 0.10%;

the relative refractive index percent of the ring segment is within a range of from about 1.40% to about 1.54%;

the relative refractive index percent of the second intermediate segment is within a range of from about 0.00% to about 0.10%;

the relative refractive index percent of the gutter segment is within a range of from about –0.16% to about –0.17%;

the outer radius of the core region is within a range of from about 1.95 μm to about 2.11 μm;

the outer radius of the moat segment is within a range of from about 4.37 μm to about 4.83 μm;

the outer radius of the first intermediate segment is within a range of from about 6.08 μm to about 6.72 μm;

the width of the ring segment is within a range of from about 1.05 μm to about 1.21 μm;

the outer radius of the second intermediate segment is within a range of from about 9.12 μm to about 10.08 μm; and

the outer radius of the gutter segment is within a range of from about 11.5 μm to about 12.0 μm.

23. (**canceled**)

24. (**previously amended**) An optical communication system, comprising:

a transmitter adapted to transmit an optical signal;

a transmission fiber in optical communication with the transmitter and adapted to receive the optical signal;

a dispersion compensation fiber in optical communication with the transmission fiber and adapted to receive the optical signal, the dispersion compensation fiber comprising:

a segmented core; and
a cladding layer on the periphery of the core;

wherein a refractive index profile of the dispersion compensating fiber is selected to provide a total dispersion for the dispersion compensating fiber having a maximum deviation of about 7 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm; and

a receiver in optical communication with the dispersion compensating fiber and adapted to receive the optical signal wherein the compensation fiber comprises:

a central core segment having a relative refractive index;

a depressed moat segment on a periphery of the central core segment and having a relative refractive index that is less than the relative refractive index of the central core segment, and an outer radius;

an intermediate segment on a periphery of the depressed moat segment and having a relative refractive index that is less than the relative refractive index of the central core segment and greater than the relative refractive index of the depressed moat segment, and an outer radius;

an annular ring segment on a periphery of the intermediate segment and having a relative refractive index that is greater than the relative refractive index of the central core segment, and a width; and

the cladding layer on a periphery of the annular ring segment and having a relative refractive index that is less than the relative refractive index of the annular ring segment and greater than the relative refractive index of the depressed moat segment; and wherein

the relative refractive index percent of the core segment is within a range of from about 1.1% to about 1.7%;

the relative refractive index percent of the moat segment is within a range of from about -1.6% to about -0.9%;

the relative refractive index percent of the intermediate segment is within a range of from about -0.1% to about 0.1%;

the relative refractive index percent of the ring segment is within a range of from about 1.0% to about 1.9%;

the outer radius of the core region is within a range of from about 1.7 μm to about 2.7 μm;

the outer radius of the moat segment is within a range of from about 3.4 μm to about 5.2 μm;

the outer radius of the intermediate segment is within a range of from about 4.9 μm to about 7.5 μm; and

the width of the ring segment is within a range of from about 0.7 μm to about 1.2 μm.

25. (**previously amended**) A dispersion and dispersion slope compensating optical fiber; comprising:

a central core segment having a relative refractive index;

a depressed moat segment on a periphery of the central core segment and having a relative refractive index that is less than the relative refractive index of the central core segment, and an outer radius;

a first intermediate segment on a periphery of the depressed moat segment and having a relative refractive index that is less than the relative refractive index of the central core segment and greater than the relative refractive index of the depressed moat segment, and an outer radius;

an annular ring segment on a periphery of the first intermediate segment and having a relative refractive index that is greater than the relative refractive index of the first intermediate segment and less than the relative refractive index of the central core segment, and a width;

a second intermediate segment on a periphery of the ring segment and having a relative refractive index that is less than the relative refractive index of the central core and greater than the relative refractive index of the moat segment;

a gutter segment on a periphery of the second intermediate segment and having a relative refractive index that is less than the relative refractive index of the second intermediate segment and greater than the relative refractive index of the depressed moat segment, and an outer radius; and

a cladding layer on a periphery of the gutter segment and having a relative refractive index that is less than the relative refractive index of the annular ring segment and greater than the relative refractive index of the depressed moat segment; and wherein

the relative refractive index percent of the core segment is within a range of from about 1.2% to about 1.8%;

the relative refractive index percent of the moat segment is within a range of from about -1.2% to about -0.7%;

the relative refractive index percent of the first intermediate segment is within a range of from about -0.1% to about 0.1%;

the relative refractive index percent of the ring segment is within a range of from about 1.1% to about 1.8%;

the relative refractive index percent of the second intermediate segment is within a range of from about -0.1% about 0.1%;

the relative refractive index percent of the gutter segment is within a range of from about –0.13% to about –.21%;

the outer radius of the core region is within a range of from about 1.7 μm to about 2.5 μm;

the outer radius of the moat segment is within a range of from about 3.7 μm to about 5.5 μm;

the outer radius of the first intermediate segment is within a range of from about 5.1 μm to about 7.9 μm;

the width of the ring segment is within a range of from about 0.9 μm to about 1.4 μm;

the outer radius of the second intermediate segment is within a range of from about 7.7 μm to about 11.5μm; and

the outer radius of the gutter segment is within a range of from about 11.0 μm to about 13.0 μm.

26. (**original**) A dispersion compensating optical fiber; comprising:

a refractive index profile having

a central core segment having a positive relative refractive index;

a depressed moat segment on a periphery of the central core segment and having a relative refractive index that is more negative than –1.2 %; and

an annular ring segment outward from the depressed moat segment and having a relative refractive index that is greater than 1.2 %.

27. (**original**) The optical fiber of claim 26 wherein the relative refractive index of the central core segment is greater than 1.1 %.

28. (**original**) The optical fiber of claim 27 wherein the relative refractive index of the central core segment is greater than 1.44 %.

29. (**original**) The optical fiber of claim 26 wherein an outer radii of the central core segment is within a range from about 1.7 μm to about 2.7 μm.

30. (**original**) The optical fiber of claim 29 wherein an outer radii of the depressed moat segment is within a range from about 3.4 μm to about 5.2 μm.

31. (**original**) The optical fiber of claim 26 wherein the refractive index profile is selected to provide a dispersion having a maximum deviation of less than about 7 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm.

32. (**original**) The optical fiber of claim 31 further comprising a maximum deviation of less than about 5 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm.

33. (**original**) The optical fiber of claim 32 wherein the refractive index profile is further selected to provide a fundamental mode bend loss of less than or equal to about 0.01 dB/km on a 4 inch diameter hub within a wavelength band from about 1550 nm to about 1610 nm.

34. (**original**) The optical fiber of claim 26 wherein the refractive index profile is further selected to provide an effective area of greater than or equal to about 17 μm^2 at a wavelength of about 1580 nm.

35. (**original**) The optical fiber of claim 26 wherein the refractive index profile is further selected to provide a straight fiber cut-off wavelength of less than or equal to about 2200 nm.

36. (**original**) The optical fiber of claim 26 wherein the refractive index profile is further selected to provide a dispersion of less than -50 ps/nm-km at a wavelength of about 1580 nm.

37. (**original**) The optical fiber of claim 36 wherein the refractive index profile is further selected to provide a dispersion of less than -75 ps/nm-km at a wavelength of about 1580 nm.

38. (**original**) The optical fiber of claim 36 wherein the refractive index profile is further selected to provide a dispersion of less than -120 ps/nm-km at a wavelength of about 1580 nm.

39. (**original**) The optical fiber of claim 38 wherein the refractive index profile is further selected to provide a total dispersion slope more negative than –2 ps/nm^2-km at 1580 nm.

40. (**original**) The optical fiber of claim 26 wherein the refractive index profile is further selected to provide dispersion values at 1550 nm and 1610 nm which when connected with a

straight line to form a chord, an extrapolation of the chord exhibits a projected zero dispersion located at a wavelength between about 1400 nm and 1520 nm.

41. (**original**) The optical fiber of claim 40 wherein the refractive index profile is further selected to provide a projected zero dispersion located at a wavelength of between about 1490 nm and 1510 nm.

42. (**currently amended**) A dispersion and dispersion slope compensating optical fiber, comprising:

a segmented core and a cladding layer on the periphery of the core wherein the segmented core and the cladding layer exhibit a fiber refractive index profile that is selected to provide a dispersion of less than about -50 ps/nm-km and dispersion slope less than about -2.0 ps/nm^2-km at a wavelength of about 1580 nm having a maximum deviation of less than about [7] 5 ps/nm-km within a wavelength band of from about 1550 nm to about 1610 nm.